8. MASTER REMOVAL SECTION

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8. Master Removal Section

[Theory of Operation]

1. Clamp Plate Opening System * Timing chart is on page VIII-6.

- Check of Master Presence on Drum

When the START button is pressed for master making or confidential operation, the Master sensor checks the presence of master on the Drum (after the Read and Write start signal is turned ON in master making).

If the Master sensor finds the master on the Drum, the Master removal sensor is activated.

- Opening of Clamp Plate

If the Position A sensor detects Position A plate (if it is confirmed that the Drum is at the home position at the same time), the Clamp solenoid is activated and the Clamp unit is pulled down, releasing the actuator of the Clamp safety switch pressed by the Clamp unit when the Clamp solenoid is not energized.

100 ms later, the Clamp motor starts rotating and opens the Clamp plate via gear engagement.

- Check of Opened Clamp Plate

When the 180° Angular sensor detects the Angular magnet on the Angular magnet plate, attached to one end of the Clamp plate shaft, the Clamp motor and Clamp solenoid are deactivated.

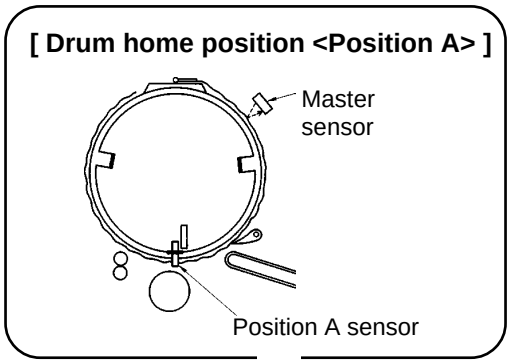
- Finish of Clamp Plate Operation

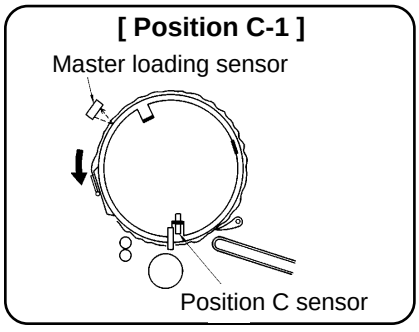
When the Clamp solenoid is deactivated, the Clamp unit is returned to the initial (retreat) position and presses the actuator of the Clamp safety switch, confirming that the operation of the Clamp plate is finished.

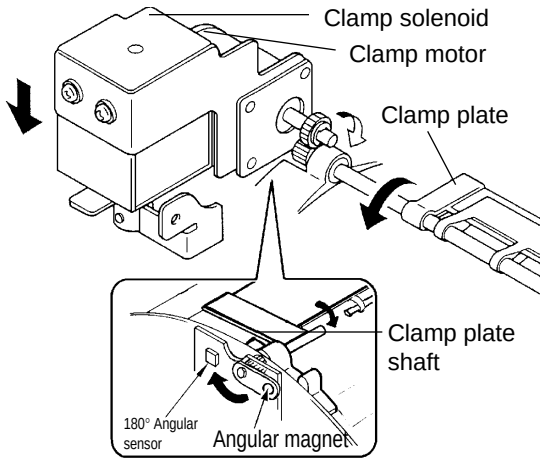
- Protection of Clamp Solenoid

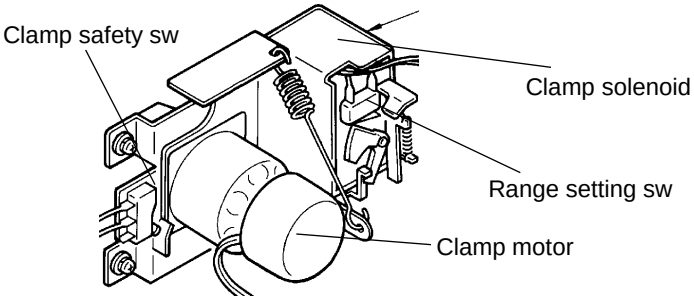
When the Clamp solenoid is energized, the Range setting switch is actuated ON to reduce the current flowing through the solenoid f protecting it against overheat.

- The presence of master on the Drum is checked by the **Master loading sensor** at **Position C-1** before *master removal* because the **Master sensor has been eliminated from GR series.**









2. Master Removal System

- Start of Master Removal

When the Clamp safety switch is actuated ON by the Clamp unit, the Master removal vertical transport motor and Master removal solenoid are energized.

By the rotation of the M.-Rmv. vertical transport motor, the Vertical transport roller (down) is rotated via pulleys and belt. The rotation of the vertical transport roller (down) is transmitted to the Vertical transport roller (up) by gears, rotating both rollers together.

At the same time, the Master removal hooks are projected by the turn of the Master removal hook shaft activated by the energized Master removal solenoid.

100 ms later, the Main motor starts rotating the Drum to remove a used master.

The lead edge of the released used master is caught by the Master removal hooks and advances between the Vertical transport rollers (up) and (down).

- Finish of Master Removal

When the Drum reaches the Position A, the Main motor is turned off to stop the Drum.

2 seconds later, the M.-Rmv. vertical transport motor and Master removal solenoid are deenergized to finish the master removal operation.

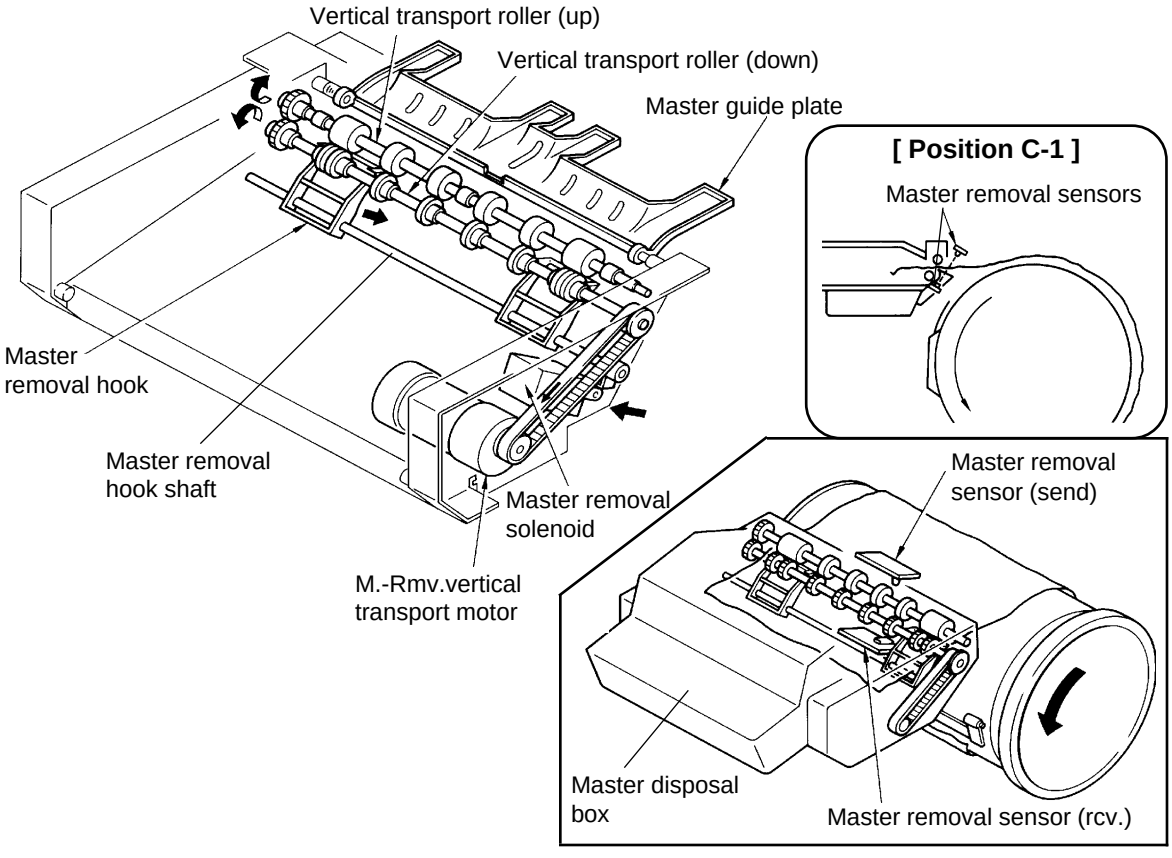
- Assistance in Master Removal Operation

The Separation fan operates and floats the top part of a released used master over the Drum, preventing the Master removal hooks from missing the master.

The Master guide plate prevents the released master from curling up and clearing the hooks.

- Function of Master Removal Sensor

If master is detected on the Drum by the Master sensor at the start of the master removal operation, the Master removal sensor checks if the light path is blocked by the removed master while the Drum is rotated from the Position **C-1** up to **the Position A**, and if it is opened again **within 2 seconds** after the Drum returns to Position A (the home position).



3. Master Removal System <GR>

- Start of Master Removal

When the Clamp safety switch is actuated by the Clamp unit, the Master removal vertical transport motor and Master removal solenoid are energized.

By the rotation of the M.-Rmv. vertical transport motor, the Vertical transport roller (down) is rotated via pulleys and belt. The rotation of the vertical transport roller (down) is transmitted to the Vertical transport roller (up) by gears.

At the same time, the Master removal hooks are projected by energizing the Master removal solenoid.

100 msec later, the Main motor starts, rotating the Drum to remove a used master.

The lead edge of the used master is caught by the Master removal hooks and advances between the Vertical transport rollers (up) and (down).

- Finish of Master Removal

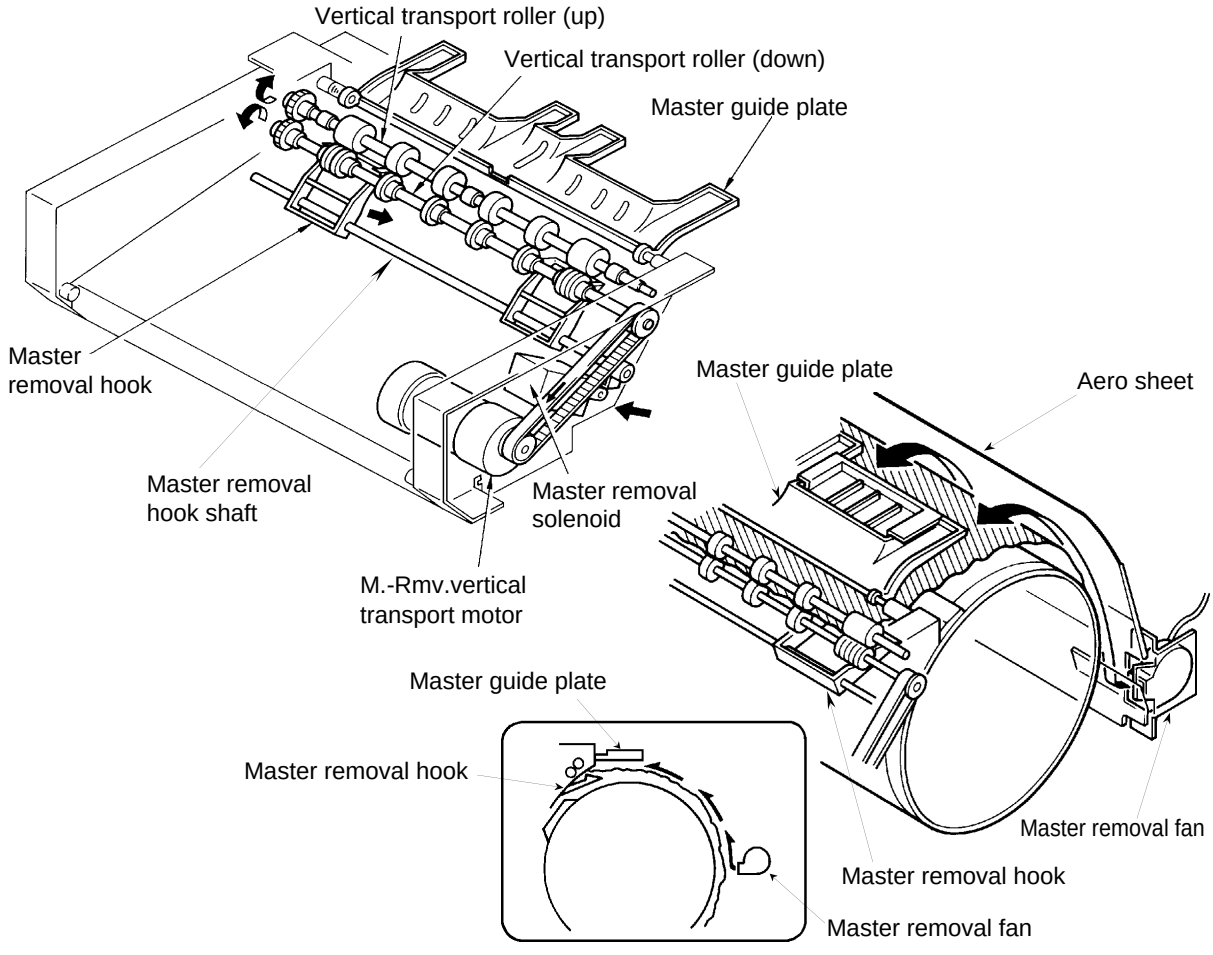
When the Drum reaches the Position A, the Main motor is turned off to stop the Drum.

2 seconds later, the M.-Rmv. vertical transport motor and Master removal solenoid are deenergized, to finish the master removal operation.

- Assistance in Master Removal Operation

The Master removal fans direct the used master over the Drum,toward the Master removal hooks. The fans are activated when the Drum comes to the Position A and deactivated at Position C-1 during the master removal.

The Master guide plate prevents the master from curling up . It also directs the master toward the Disposal Hooks



4. Master Removal Check System <GR>

- Check of Master Presence on Drum

The Master loading sensor checks the presence of master on the Drum at the start of the Master disposal operation (at the Position C-1).

- Check of Passage of Removed Master

When a master is detected on the Drum by the Master loading sensor, the Master removal sensor checks the light path of the removed master while the Drum is rotated from the Position **C-1** up to **Position A**, This also occurs if it is opened again **within 2 seconds** of the Drums return to the Position A (the home position).

- Detection of Master Removal Jam

The Master removal hook sensor checks whether the hooks are correctly returned to their home position when the Master removal solenoid is deactivated.

If the light path of the Master removal hook sensor is not blocked while the machine is idle, it is assumed that the removed master is jammed on the Master removal hooks and the error message "**REMOVE JAMMED MASTER IN DISPOSAL UNIT**" or **[E 26]** is displayed.

The same error message is diplayed if the light path of the Master removal sensor is blocked.

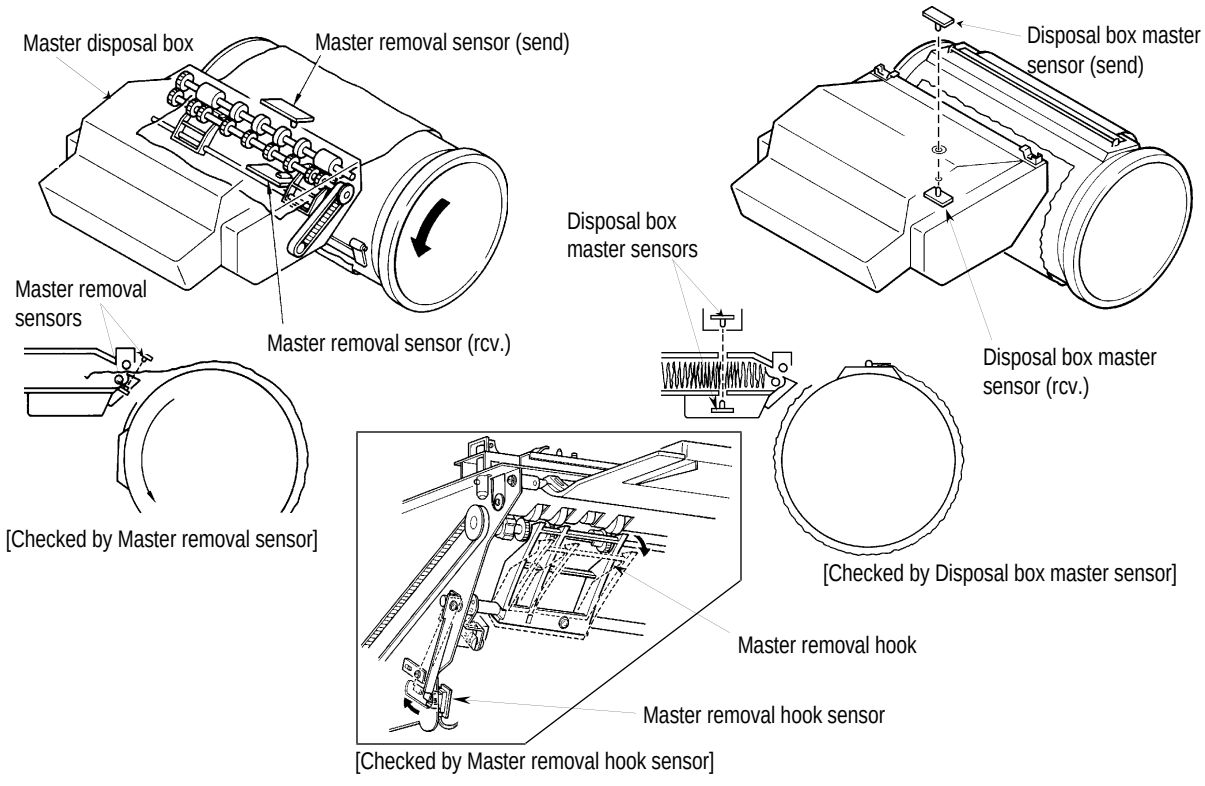
- Check of Quantity of Disposed Masters

The Master removal sensor counts the number of masters that go into the Master disposal box.

The master disposal count is increased each time the light path of the sensor is blocked.

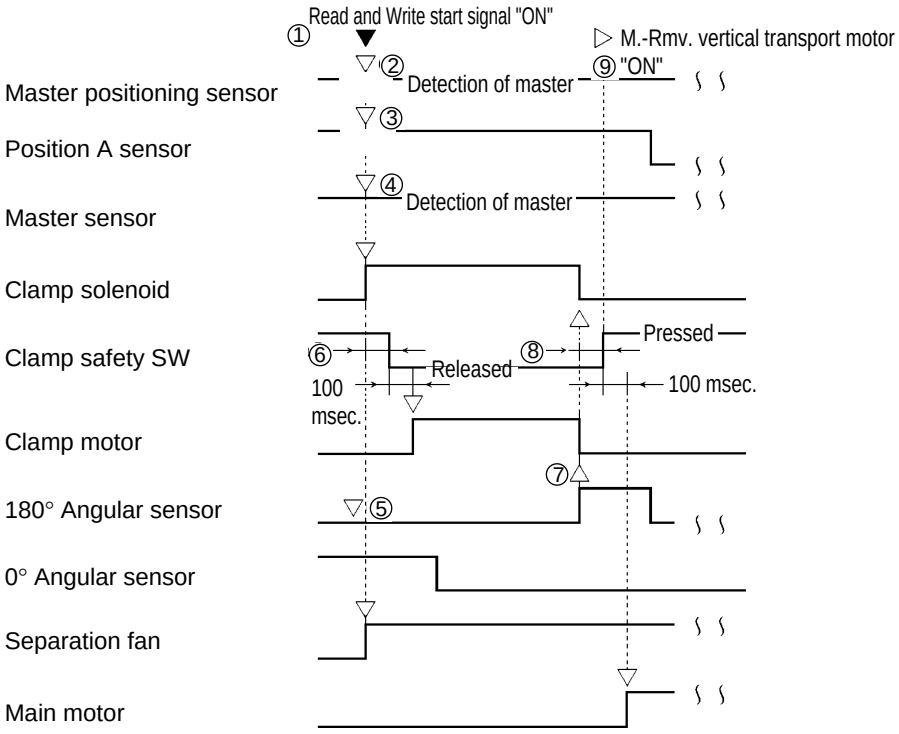
The message or LED indication "**EMPTY DISPOSAL BOX**" is displayed when the count in RAM memory on the System PCB reaches the set amount (**30** for GR3750 and **50** for other models).

The Disposal box master sensor checks the presence of disposed masters inside the Master disposal box. The master disposal count is only reset to "0" if the Disposal box master sensor confirms no masters remain in the box after the Master disposal box is pulled out to discard used masters due to the "EMPTY DISPOSAL BOX" indication.


Master disposal box
Master removal sensor (send)
Master removal sensors
Master removal sensor (rcv.)
[Checked by Master removal sensor]
Disposal box master sensor (send)
Disposal box master sensors
Disposal box master sensor (rcv.)
[Checked by Disposal box master sensor]
Master removal hook
Master removal hook sensor
[Checked by Master removal hook sensor]

- Timing Chart -

Clamp Plate Opening System



① When the Read and Write Start signal is active, the Image scanner reads an original and the Thermal print head burns an image on a master.

② If the Master positioning sensor detects no master, master material is fed towards the Drum until the sensor detects the leading edge of master.
The Master positioning sensor is required to detect master material before the Clamp plate opening operation starts.

③ If the Position A sensor does not detect the Position A plate before the Clamp plate opening operation starts, the Drum rotates until the sensor detects the Position A plate.

④ If the Master sensor detects master on the Drum, the Master removal sensor is set active during master removal operation. If not, the Master removal sensor remains inactive.
In both cases, the Total master counter increases by 1.

⑤ If the 180° Angular sensor detects the Angular magnet, the next movement starts from ⑨.

⑥ If the Clamp safety switch has not been released OFF **within 4 seconds** after the Clamp solenoid is energized, the Clamp solenoid is deenergized and the Drum rotates once for the Position A. Then the Clamp solenoid is energized once again.
If the Clamp safety switch has not been released OFF **within 4 seconds** again, the machine assumes a Clamp error-1 has occurred and indicates the error code **[E 03]**.

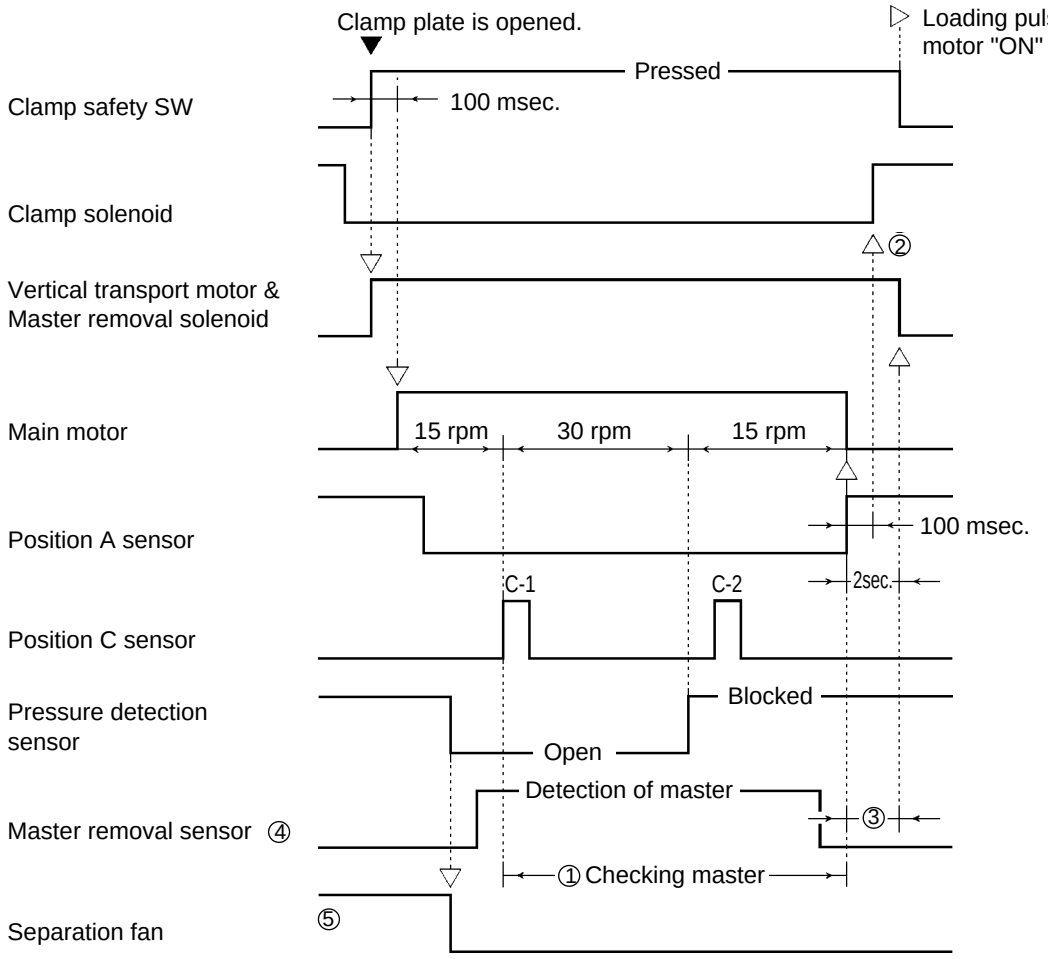
⑦ If 180° Angular sensor has not detected a magnet **within 8 seconds** after the Clamp motor is activated, the Clamp motor and Clamp solenoid are deactivated and the Drum rotates once for the Position A. Then the Clamp motor and Clamp solenoid are activated once again.
If the magnet has not been detected by the 180° Angular sensor **within 8 seconds** again, the machine assumes a Clamp error-1 has occurred and indicates the error code **[E 03]**.

⑧ If the Clamp safety sw has not been pressed **within 4 seconds** after the Clamp solenoid is de-energized, the machine assumes a Clamp error-1 has occurred and displays the error code **[E 03].**

⑨ When the Clamp safety switch is actuated ON by the return of the Clamp solenoid, the Master removal vertical transport motor and Master removal solenoid are activated.

- Timing Chart -

Master Removal System



① The Master removal sensor is set active only when the Master sensor detects master on the Drum prior to master removal operation, to check the transportation of a used master during master removal operation.
When the light path of the Master removal sensor is blocked by a used master, the sensor checks if it is still blocked **0.5 seconds later**. If so, the machine assumes that the removed master is being transported into the Master disposal box without errors.
If the light path of the sensor has not been blocked since the **Position C-1** by the **Position A**, the machine assumes a Master removal error has occurred and indicates the error code **[E 25]**.

② If the Master removal sensor still detects a removed master when the Drum stops at the position A, the Clamp solenoid will not be energized until the light path of the sensor is opened.
(The waiting time is **2 seconds** at maximum.)

③ If the Master removal sensor has not been opened **within 2 seconds** after the Drum returns to the postion A, the machine assumes a removed master blocks up the entrance into the Master disposal box and indicates the error code **[E 25]**.

④ If the light path of the Master removal sensor is blocked in any time except master removal operation, the machine assumes that a removed master blocks up the entrance into the Master disposal box and indicates the error code **[E26]**.

⑤ As for the activation time of the Separation fan, refer to the timing chart on the page VIII-4.